

# Peptoniphilus asaccharolyticus Septic Abortion Precipitating Cerebral Venous Thrombosis

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## ABSTRACT

Peptoniphilus, a Gram-positive anaerobic coccus, is an opportunistic bacterium in the human microbiota. Obstetrics-associated *Peptoniphilus asaccharolyticus* infections are rarely reported, with only four reported cases, all patients recovered without complications. We describe a *P. asaccharolyticus* septic abortion at 8 weeks of gestation, complicated with cerebral venous thrombosis (CVT) and septic ileus. A 33 year-old Indonesian lady who is 8 weeks pregnant presented with sudden right-sided body weakness, with heavy vaginal bleeding and fever. She had attempted a self-induced abortion using over-the-counter medication prior to symptom onset. She was pale and septic. Besides evacuation of conception products, the patient was hospitalized for parenteral antibiotics therapy. Brain CT angiography revealed CVT. Anaerobic blood culture grew *P. asaccharolyticus*, identified via MALDI-TOF mass spectrometry. Her admission was complicated with septic ileus. Following eight days of antibiotics treatment, she requested a transfer to her hometown hospital for care continuation. *P. asaccharolyticus* is a disastrous organism to complicate septic abortions. Early clinical suspicion and prompt initiation of effective antibiotics are critical.

## Keywords

Septic abortion, Peptoniphilus, cerebral venous thrombosis, MALDI-TOF

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## INTRODUCTION

The Peptoniphilus genus is a Gram-positive obligate anaerobic coccus belonging to the family *Peptoniphilaceae*. Formerly classified under the genus Peptostreptococcus, it is now a separate genus consisting of 17 species. They are known as members of human gastrointestinal, genitourinary and skin microbiota. Increasing number of human infections caused by this opportunistic pathogen have been reported. Individuals with prosthetic joints or other foreign body introduction, the immunosuppressed and the elderly are at higher risk for infection. However, obstetric cases of Peptoniphilus spp. infections have been rarely reported, with only four cases documented globally. Notably, none of these cases involved septic abortion complicated by CVT. We present a case of *Peptoniphilus asaccharolyticus* septic abortion, complicated with cerebral venous thrombosis (CVT) and septic ileus.

## CASE HISTORY

A 33 year old Indonesian lady was referred by a private hospital for symptomatic anaemia. Initially, she presented

to the hospital complaining of sudden onset of right-sided body weakness and numbness. She had been having heavy vaginal bleeding for a week, worsening during the last two days. Additionally, she reported vomiting and abdominal pain for four days and two days of fever, chills and rigors. Upon discovering she was 8 weeks pregnant, she resorted to terminating pregnancy using over-the-counter unnamed medication, which she inserted intra-vaginally, one day prior to symptom onset. She denies facial asymmetry or drooling of saliva.

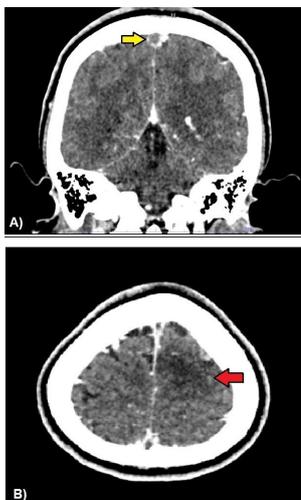
On examination, she appeared pale, lethargic, febrile with a temperature of 38°C and tachycardic of 110 beats per minute. She was normotensive with normal oxygen saturation under room air. Abdominal and cardiorespiratory examinations were unremarkable. Neurological examination revealed right-side facial palsy; and hypotonia, with a low muscle power scale of 0/5 over the right upper and lower limbs, compared to 5/5 on the contralateral side. A bedside abdominal ultrasound scan

revealed a thickened endometrial lining of 4.3cm, with neither adnexal mass nor pelvic free fluid.

Urgent full blood count revealed leucocytosis with a total white cell count of  $20.67 \times 10^3/\mu\text{L}$  and moderate anaemia with haemoglobin of 7.2 g/dL. The urine dipstick for the pregnancy test was positive. Platelet count, coagulation profile, and renal and liver function tests were unremarkable. Serum  $\beta$ -human chorionic gonadotropin ( $\beta$ -hCG) was elevated (4,999 mIU/mL).

Per vaginal examination revealed approximately 50 cc of the retained product of conception, which the attending doctor evacuated with sponge forceps. A post-evacuation transvaginal ultrasound showed a reduction in endometrial thickness to 2 cm. The patient was given intramuscular oxytocin/ergometrin 500  $\mu\text{g}/5$  IU, a peripheral blood sample was aseptically collected and cultured, and the patient's antibiotic therapy was then commenced with intravenous (IV) ceftriaxone 2 gm daily and IV metronidazole 500 mg thrice daily. She was then admitted to the ward for a blood transfusion.

A computed tomography angiogram of the brain and carotids was performed and demonstrated cerebral venous thrombosis of the superior sagittal sinus and right sigmoid sinus, with acute venous infarct at the left frontal lobe (Figure 1). There was no evidence of aneurysm or arterio-venous malformation. She was started on subcutaneous enoxaparin 60 mg twice daily.



**Figure 1 (A) and (B):** Computed tomography angiogram of patient's brain. Note the filling defect over the superior sagittal sinus (yellow arrow), suggestive of cerebral venous sinus thrombosis, with acute venous infarct at the left frontal lobe (red arrow).

After 25 hours of incubation in BD BACTEC™, blood culture was flagged positive. A Gram stain was performed and showed Gram-positive cocci in clusters. Aerobic cultures on blood agar, chocolate agar, and MacConkey agar did not yield any growth. After 48 hours of anaerobic incubation, the anaerobic blood agar culture demonstrated pure growth of small, mucoid, grey colonies (Figure 2). The growth was identified via matrix-assisted laser desorption ionization time of flight mass spectrometry (MALDI-TOF) MS (Bruker Daltonics, Bremen, Germany), yielding *Peptoniphilus asaccharolyticus* with log[score] value of 2.17, using a direct transfer method. Antimicrobial susceptibility testing was performed via gradient minimum inhibitory concentration (MIC) strip (LiofilchemÒ, Roseto degli Abruzzi, Italy), using a 0.5 McFarland colony inoculum suspension and incubated anaerobically in an anaerobe chamber for 48 hours. The isolate demonstrated susceptibility to both penicillin and metronidazole, with MIC levels of 0.016  $\mu\text{g}/\text{mL}$  and 0.75  $\mu\text{g}/\text{mL}$ , respectively, as interpreted according to the Clinical and Laboratory Standards Institute (CLSI) M100, 34th Edition guidelines.



**Figure 2:** *Peptoniphilus asaccharolyticus* colonies on blood agar medium, following 48 hours of anaerobic incubation. Note the opaque greyish non-haemolytic colony with raised center.

The aerobic blood culture remained sterile during the five days of incubation. High vaginal swab culture grew *Candida albicans*. Products of conception tissue were not sent for culture; instead, only a tissue swab was sent, which also grew *Candida albicans*.

On her fifth day of admission, her condition was complicated by septic ileus, which resolved after one day of nasogastric tube insertion and hydration. After the eighth day of hospitalization, she was discharged upon her request to be transferred to a district hospital in Indonesia for continuation of care, nearer to her relatives.

## DISCUSSION

Up to 30% of human anaerobic infections are caused by Gram-positive anaerobic cocci, commonly encountered in the female genital tract, soft tissue, and orthopaedic infections. *Peptoniphilus* species is reported to be isolated from blood, bone, joint, skin, and soft tissue infections, vaginosis, and various organ abscesses such as kidneys, peritonsillar, and spine. Most *Peptoniphilus* infections, similar to other anaerobic infections are part of polymicrobial infections, with few monomicrobial infections reported among the elderly, immunosuppressed, and post-operative patients.<sup>1</sup> For this patient, *P. asaccharolyticus* was not isolated in the products of conception because only a swab was sent. According to our local laboratory flow, only aerobic culture will be performed for swab cultures. A proper tissue culture, instead of the swab, would guarantee a better organism yield, including anaerobic bacteria. This highlights the importance of proper communication between clinicians and laboratory staff in alerting both to the possibility of anaerobic infections in cases of septic abortion and the correct way to obtain and transport relevant clinical specimens for better organism yield.

Anaerobic bacterial infections have been a diagnostic challenge for both clinicians and microbiologists alike. With severe, invasive infections abruptly manifesting in patients, clinicians usually treat the infections empirically with antibiotic agents targeting Gram-negative bacteria, some of which do not have coverage against anaerobic microorganisms.

From the microbiology laboratory staff's perspective, anaerobic organisms are not only fastidious and require special culture media and prolonged incubation conditions, but conventional bacterial identification testing often fails to differentiate beyond the genus level. For instance, biochemical testing fails to differentiate between *P. barei* and *P. asaccharolyticus*. Fortunately, MALDI-TOF MS has proved reliable in identifying clinically significant anaerobic bacteria. Although inferior to its newer competitors, VITEK MS and MALDI Biotyper system, the identification accuracy of *Peptoniphilus spp* using MALDI-TOF MS was found to be as high as 86%, with a 95% CI of 81 to 91%.<sup>2</sup>

Cerebral venous thrombosis is a rare venous thrombotic event predominant in females. It is triggered by the imbalance between haemostasis, rendering sluggish venous blood flow and disturbance in cerebral perfusion. For this patient, her known prothrombotic risk factors include pregnancy and sepsis, although there may be additional undiagnosed thrombophilia or comorbidity predisposing to the phenomenon. Fortunately, CVT carries a good prognosis, and most patients survive with almost no permanent neurological deficit. Our patient was lost in follow-up due to her transfer to her hometown hospital, thus her recovery was not confirmed. The chronological association between foetal outcome and obstetric CVT remains uncertain. Bertani described a severe case of CVT in early trimester pregnancy, leading to significant long-term neurological damage and spontaneous abortion.<sup>3</sup> In our case, septic abortion occurred prior to the neurological event.

Brown and colleagues have compiled 15 cases of peptoniphilus bacteraemia and their outcomes. Among these cases, all three pregnancy-related peptoniphilus bloodstream infections involved young mothers. The prognosis for the conceptus was grimmer than that of adults. Specifically, the overall mortality rate of adult patients was 20%, involving elderly patients above 80 years old with significant comorbidities. However, despite the survival of all peptoniphilus-infected pregnant mothers, only one was able to return home with her surviving newborn.<sup>4</sup> This may be due to the differences in the gestational age between the patients at the time of infection, as the mother of the only surviving baby was in the third trimester at the onset of infection. This theory is supported by Althaqafi and colleagues, who reported second-trimester loss.<sup>1</sup> Based on the previously discussed case reports, our case represents the fifth documented instance of *P. asaccharolyticus* septic abortion worldwide.

The Malaysian National Antimicrobial Guideline recommends a 14-day regime of the combination therapy of ampicillin, gentamicin, and metronidazole for septic abortions. Alternative combinations include ampicillin/sulbactam plus oral doxycycline or clindamycin with gentamicin. Although the clinician empirically treated this patient with ceftriaxone and metronidazole instead of

the recommended antibiotics, the isolate was tested susceptible to both antibiotics.

## CONCLUSION

Septic abortion can aggravate the rare pregnancy-induced cerebral venous sinus thrombosis. The anaerobic peptoniphilus is an organism capable of complicating septic abortions. Upon clinical suspicion of septic abortion, immediate commencement of effective antibiotics is vital for achieving a favourable prognosis for patients. MALDI-TOF MS serves as a reliable diagnostic tool for rapid identification of anaerobic organisms.

## ACKNOWLEDGEMENT

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